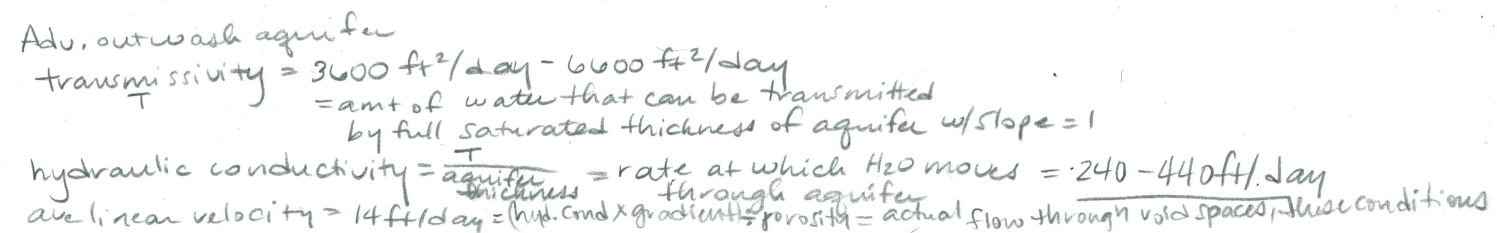


$$\frac{1}{2}'' = 50$$

Adv. outwash aquifer appears to be recharged by vertical infiltration through drift & fill units

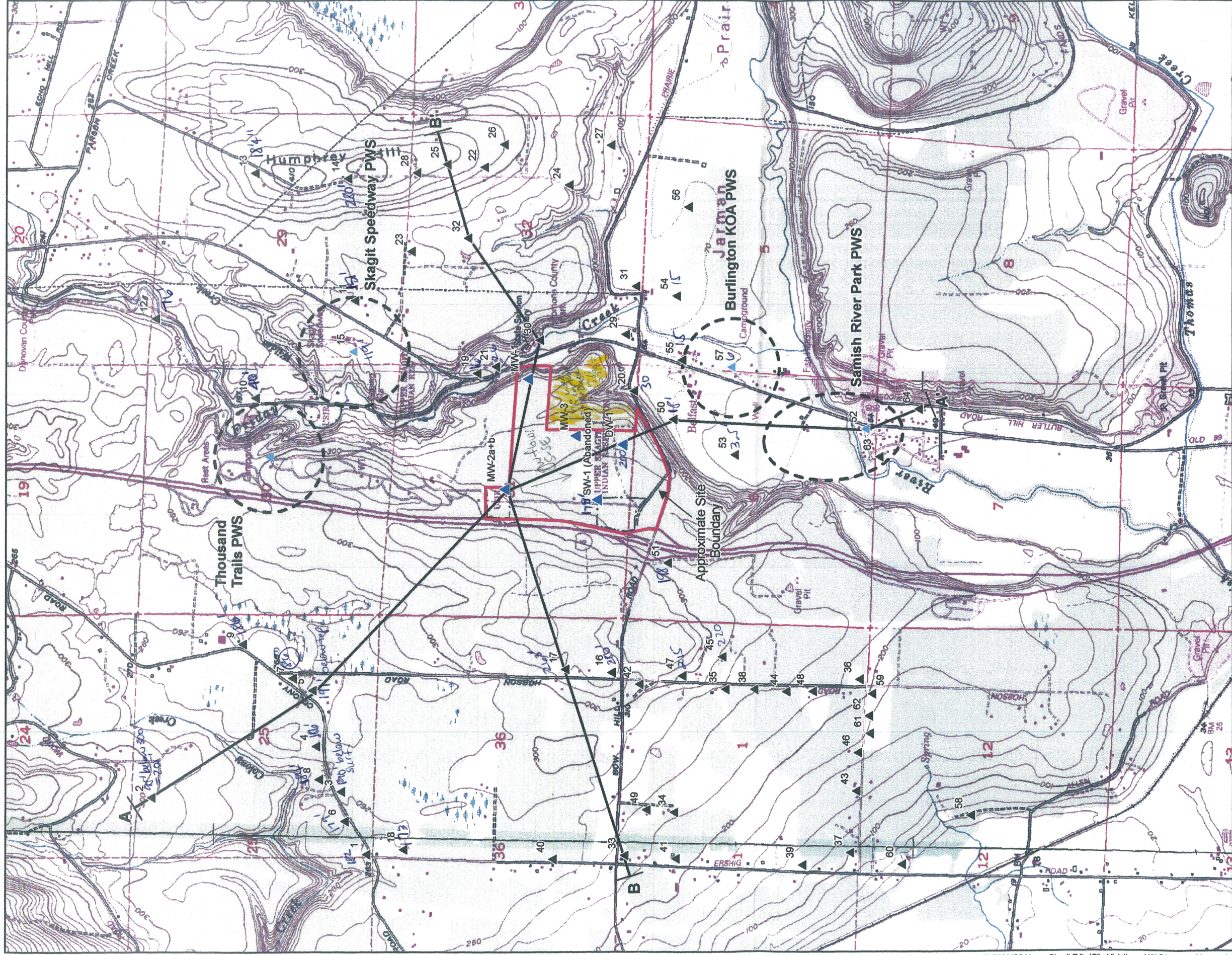








SWL



REFERENCE: USGS 7.5 Minute Topographic Map Bow and Alger, Washington.

### Legend

- ▲ Public Water System Wells
- ▲ Ground Water Monitoring Well
- ▲ WSDOE Well Logs
- - - Wellhead Protection Area
- Geologic Profiles
- Approximate Site Location

Associated Earth Sciences, Inc.

SITE VICINITY AND WELL LOCATION MAP

FIGURE 1

UPPER SKAGIT TRIBE  
SKAGIT COUNTY, WASHINGTON

DATE 9/08

PROJ. NO. EH080149A





DEPARTMENT OF HEALTH & HUMAN SERVICES

Indian Health Service  
Seattle District Office

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APR 28 2009

U.S. EPA REGION 10  
OFFICE OF COMPLIANCE AND ENFORCEMENT

Public Health Service

2201 Sixth Avenue, Room 925  
Seattle, Washington 98121

Phone 206/615-2799  
Fax 206/615-2797

22 April 2009

Ms. Jennifer Parker  
Ground Water Unit  
U.S. Environmental Protection Agency, Region 10  
1200 Sixth Avenue, Suite 900, OCE-082  
Seattle, Washington 98101

Re: Upper Skagit Indian Tribe – Skagit Valley Casino Water Reclamation Facility

Dear Ms. Parker:

In accordance with the Interagency Agreement IHS performed a review of the pre-design report for the above mentioned Water Reclamation Facility. I am concerned about the lack of alternative development and believe the most feasible (economically) option to service the future wastewater volume is to upgrade the existing force main to Burlington. However, without an alternative development with costs it is not clear what the most economically feasible option is. The Tribe does not have to select the most economically feasible option to serve the current and future wastewater needs but we would be remiss if we didn't point out the lack of alternative development in the pre-design report. This project will not be funded by either EPA or IHS funds.

I am far more concerned about the potential risk to the health of Tribal members by possible contamination of the ground water aquifer. The report proposes that the effluent be injected directly into the aquifer 140 below ground level via two injection wells. This is the first proposal we have seen to dispose of effluent in this fashion. We believe this aquifer is a source of drinking water as there are wells indicated on the map. Therefore, the effluent needs to be treated to the National Primary Drinking Water Standards prior to injection and the facility must be designed to comply with the most stringent reclamation facility standards. Monitoring wells must be installed in-line down gradient of the injection wells and monitored to verify that the recharged effluent does not impact the source of drinking water.

The primary difference between a reclamation plant and a wastewater treatment plant is that a reclamation plant requires additional reliability and redundancy features. Since the effluent is injected directly into the source of drinking water the facility must go beyond the minimum requirements for a reclamation facility. In order to adequately protect the source of drinking water a discharge permit is strongly recommended in lieu of a rule authorization with conditions.

The Portland Area Indian Health Service refers to the State of Washington Department of Ecology, the State of Washington Department of Health, and the EPA guidelines for similar projects within the Portland Area. Although these State Regulations do not apply



on Tribal trust land they represent good engineering practice and are regularly applied in the absence of specific federal guidelines. As a reference I suggest that the Washington State "Criteria For Sewage Works Design" (Revised October 2006, Publication No. 98-37 WQ), the Washington State "Water Reclamation and Reuse Standards" (September 1997, Publication #97-23), the Washington State WAC 173-200 and 246-290, 40CFR141, and the EPA Guidelines for Reliability (Class 1 Federal Water Quality Administration Guidelines for Reliability) be consulted for continuing design work.

The following concerns are identified:

1. Insufficient safeguards if effluent quality drops. The equalization basin only provides one day of storage above the normal operating depth and the report indicates that the Burlington force main is not able to handle the projected increase in flow. There is no effluent storage prior to injection that would allow for additional runtime or verification monitoring. System failure would necessitate closing the contributing facilities (casino, campground, homes, etc.) down.
2. Insufficient reliability and redundancy features are included in the design. Examples of these are online monitoring, short and long term storage, and redundant disinfection equipment. One way to meet this requirement is to arrange for all wastewater to be received by another regulated wastewater treatment plant. However, the facilities would have to be available to handle 100% of the flow and we would suggest that a signed agreement with the owner and operator of the receiving plant be in place. This could be accomplished by upgrading the existing 3,000 feet of Burlington force main to accommodate the projected flow.
3. Insufficient effluent monitoring. The design plan only addresses BOD, TSS, turbidity, coliform and nitrogen; there are many other primary drinking water standards (40CFR141), such as VOCs, SOCs, which are not addressed in the design plan. See Table 1 (page 69 in attachment) for Treatment requirements and Table 2 (page 70 in attachment) for Monitoring requirements for "Direct recharge into potable ground water aquifers". In addition the monitoring wells located both down and up gradient must be monitored in accordance with Table 2.
4. The plan proposes to use 10 mg/L standard for Nitrate. Whereas this is the MCL for Nitrate in a public drinking water system 5 mg/l is the action level. If Nitrate levels meet or exceed 5 mg/L in a regulated drinking water system special requirements and education are required in the annual consumer confidence report. We recommend that the treatment standard be less than 5 mg/L.
5. We are very concerned that the receiving aquifer and nearby drinking water wells, including possible future wells, will not be adequately protected from possible contamination from the 140 foot deep injection wells. The high conductivity of the Vashon Glacial Outwash is a poor barrier and contamination could travel quickly to a nearby drinking water well. Especially given the hydraulic gradient



(induced groundwater movement away from the injection well) from the injection wells. Reclamation standards require that reclaimed water be retained in the ground for a minimum of 12 months prior to being withdrawn for drinking water. Without tracer studies at maximum flow on every well this would be very difficult to prove. Additionally reclamation standards require a minimum horizontal separation between the point of injection and the nearest drinking water well be greater than 2,000 feet. Reclamation standards also require that monitoring wells be placed at 500 feet and 1,000 feet down gradient and designed to intercept the recharged water.

6. The alternatives were not developed to the point of being able to select the most feasible option. Costs were not provided for the other alternatives. We would recommend that the Tribe be presented the true costs to build, operate, and maintain each alternative for a 20 year design life.

If you have any questions or concerns regarding this review please feel free to contact me to schedule a meeting to discuss further.

Sincerely,



Steven Anderson, PE  
CAPT United States Public Health Service  
Portland Area Indian Health Service  
Seattle District Office  
2201 Sixth Ave., Rm. 925, M/S 30  
Seattle, WA 98121

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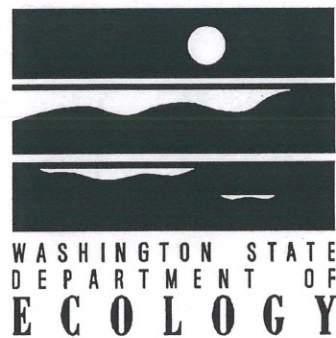
Attachments:

Excerpt (18 pages total - various pages from cover page to page 71) from Water Reclamation and Reuse Standards Publication #97-23 September 1997



# Water Reclamation and Reuse Standards

September 1997



September 1997  
Publication #97-23



Section 1. Minimum Quality .....	45
Section 2. Water Quality Criteria .....	45
Section 3. Loading Rates.....	45
Section 4. Ammonia .....	46
Section 5. Metals. ....	46
<b>Article 4. Biological Criteria: Standards in Wetlands Receiving Reclaimed Water .....</b>	<b>46</b>
Section 1. Beneficial Uses.....	46
Section 2. Natural Conditions. ....	46
Section 3. Biological Criteria .....	46
<b>Article 5. Ground Water Protection Criteria.....</b>	<b>47</b>
Section 1. Hydrogeologic Evaluation.....	47
<b>Article 6. Net Environmental Benefit.....</b>	<b>47</b>
Section 1. Required Demonstrations. ....	47
<b>Article 7. Application and Monitoring Requirements .....</b>	<b>48</b>
Section 1. Background Studies.....	48
Section 2. Operational Monitoring.....	48
<b>Article 8. Summary of Standards .....</b>	<b>49</b>
Section 1. Reclaimed Water Treatment and Quality Requirements.....	49
Section 2. Monitoring Requirements.....	49
<b>Table 1. Treatment and Quality Requirements for Reclaimed Water Use.....</b>	<b>49</b>
<b>Table 2. Monitoring Requirements.....</b>	<b>50</b>
<b>SECTION 3 - STANDARDS FOR DIRECT AQUIFER RECHARGE.....</b>	<b>51</b>
<b>Article 1. Applicability.....</b>	<b>51</b>
Section 1. Applicability.....	51
<b>Article 2. Treatment Requirements.....</b>	<b>51</b>
Section 1. Potable Ground Water. ....	51
Section 2. Nonpotable Ground Water.....	51
Section 3. Other Methods of Treatment.....	52
<b>Article 3. Reclaimed Water Quality Requirements.....</b>	<b>52</b>
Section 1. Direct Recharge to Potable Ground Water. ....	52
Section 2. Direct Recharge to Nonpotable Ground Water.....	53
Section 3. Point of Compliance. ....	53
<b>Article 4. Sampling and Analysis.....</b>	<b>54</b>
Section 1. Oxidized Wastewater.....	54
Section 2. Filtered Wastewater.....	54
Section 3. Reclaimed Water. ....	54
Section 4. Ground Water from Monitoring Wells.....	55
Section 5. Laboratory Methods and Analyses .....	55
<b>Article 5. Operational Requirements .....</b>	<b>55</b>
Section 1. Personnel.....	55
Section 2. Maintenance.....	55
Section 3. Operating Records and Reports.....	55



Section 4. Bypass.....	56
Section 5. Disinfection .....	56
Section 6. Responsibilities .....	56
Section 7. Retention Time in the Underground .....	57
Section 8. Separation Distance in the Underground .....	57
Section 9. Ground Water Monitoring.....	57
<b>Article 6. General Requirements of Design .....</b>	<b>58</b>
Section 1. Flexibility of Design.....	58
Section 2. Alarms.....	58
Section 3. Power Supply.....	59
Section 4. Storage, Where No Approved Alternative Disposal System Exists .....	59
<b>Article 7. Alternative Reliability Requirements .....</b>	<b>59</b>
Section 1. Emergency Storage or Disposal .....	59
Section 2. Biological Treatment.....	60
Section 3. Secondary Sedimentation .....	60
Section 4. Coagulation.....	61
Section 5. Filtration.....	61
Section 6. Reverse Osmosis. ....	62
Section 7. Disinfection .....	62
Section 8. Other Alternatives to Reliability Requirements.....	63
<b>Article 8. Reclaimed Water Transmission and Distribution System Requirements.....</b>	<b>63</b>
Section 1. General .....	63
Section 2. Cross-Connection Control .....	64
Section 3. Setback Distances.....	64
<b>Article 9. Engineering Report.....</b>	<b>65</b>
Section 1. Engineering Report.....	65
<b>Article 10. Pilot Plant Study .....</b>	<b>67</b>
Section 1. Pilot Plant Study .....	67
<b>Article 11. Summary of Standards.....</b>	<b>68</b>
Section 1. Treatment and Water Quality Requirements .....	68
Section 2. Monitoring Requirements.....	68
<b>Table 1. Treatment /Quality Requirements for Direct Recharge with Reclaimed Water .....</b>	<b>69</b>
<b>Table 2. Monitoring Requirements for Direct Recharge with Reclaimed Water.....</b>	<b>70</b>



## **SECTION 3 - STANDARDS FOR DIRECT AQUIFER RECHARGE**

### **Article 1. Applicability**

#### ***Section 1. Applicability***

These standards shall apply only to planned, direct ground water recharge projects using reclaimed water. The creation or operation of direct recharge facilities to cause the injection of reclaimed water into a ground water basin is evidence of a planned ground water recharge project.

### **Article 2. Treatment Requirements**

#### ***Section 1. Potable Ground Water***

- (a) AKART shall be applied to all wastewater prior to direct recharge.
- (b) Reclaimed water used for direct recharge to potable ground water aquifers shall be reclaimed water that, as a minimum, is at all times an oxidized, coagulated, filtered, reverse osmosis-treated, disinfected wastewater.
- (c) Any withdrawal facilities constructed solely for the purpose of extracting reclaimed water from the underground shall comply with chapter 173-136 WAC and chapter 173-150 WAC.
- (d) It is recommended that all direct recharge projects prepare a comprehensive water and/or sewer plan in accordance with chapter 173-240 WAC, chapter 246-271 WAC (as applicable), and chapter 246-290 WAC, and include a complete description of the proposed recharge project. The project description shall discuss the estimated beneficial uses, the expected users, and the intended water rights status (artificially stored per chapter 173-136 WAC, or abandoned and available for appropriation to others) of all of the reclaimed water to be stored in the recharged ground water. The comprehensive plan should be prepared in addition to the engineering report required within these standards.

#### ***Section 2. Nonpotable Ground Water***

- (a) AKART shall be applied to all wastewater prior to direct recharge.
- (b) As a minimum, reclaimed water used for direct recharge to nonpotable ground water aquifers shall be Class A reclaimed water.
- (c) Any withdrawal facilities constructed solely for the purpose of extracting reclaimed water from the underground shall comply with chapter 173-136 WAC and chapter 173-150 WAC.
- (d) It is recommended that all direct recharge projects prepare a comprehensive water and/or sewer plan in accordance with chapter 173-240 WAC, chapter 246-271 WAC (as applicable), and chapter 246-290 WAC, and include a complete description of the proposed recharge project. The project description shall discuss the estimated beneficial uses, the expected users, and the intended water rights status (artificially stored per chapter 173-136 WAC, or abandoned and available



for appropriation to others) of all of the reclaimed water to be stored in the recharged ground water. The comprehensive plan should be prepared in addition to the engineering report required within these standards.

**Section 3. Other Methods of Treatment**

- (a) Methods of treatment other than those included in these standards and their reliability features may be accepted if the applicant demonstrates to the satisfaction of the Washington Departments of Health and Ecology that the methods of treatment and reliability features will assure an equal degree of treatment, public health protection, and treatment reliability.
- (b) For direct recharge into nonpotable ground water aquifers, pilot plant or other studies may be required to demonstrate that methods of treatment other than those specified in these standards are capable of reliably producing reclaimed water that meets all applicable reclaimed water quality limits specified in these standards.
- (c) For direct recharge into potable ground water, pilot plant or other studies are required to demonstrate that methods of treatment other than those specified in these standards are capable of reliably producing reclaimed water that meets all applicable reclaimed water quality limits specified in these standards.
- (d) Projects that propose methods of treatment other than outlined within these standards are urged to request pilot project status from the Departments of Ecology and Health as outlined within chapter 90.46 RCW.

**Article 3. Reclaimed Water Quality Requirements**

**Section 1. Direct Recharge to Potable Ground Water**

- (a) Reclaimed water used for direct recharge to potable ground water aquifers shall meet the water quality criteria for primary contaminants (except nitrate), secondary contaminants, radionuclides, and carcinogens listed in Table 1 in chapter 173-200 WAC and any other maximum contaminant levels pursuant to chapter 246-290 WAC.
  - (1) The total coliform requirement specified in Table 1 in chapter 173-200 WAC shall be determined pursuant to Article 5, Section 3(c), and the number of total coliform organisms shall not exceed 5/100 mL in any sample.
  - (2) For the primary contaminants, secondary contaminants, and radionuclides listed in Table 1 in chapter 173-200 WAC, the criteria shall be the most stringent concentration of the following and those listed in Table 1 in chapter 173-200:
    - (i) Maximum contaminant level goals;
    - (ii) Maximum contaminant levels; and

- (iii) State maximum contaminant levels published in chapter 246-290 WAC as presently promulgated or subsequently amended or repromulgated.
- (3) The criteria for primary and secondary contaminants and radionuclide contaminants in Table 1 in chapter 173-200 WAC shall be amended as the federal and state rules are amended and without amendment of these standards.
- (b) In addition, the reclaimed water shall meet the following water quality criteria:
  - (1) Turbidity  $\leq$  0.1 NTU (average) and 0.5 NTU (maximum);
  - (2) Total nitrogen  $\leq$  10 mg/L as N;
  - (3) TOC  $\leq$  1.0 mg/L; and
  - (4) any other constituent limits deemed appropriate by the Departments of Ecology or Health.

**Section 2.      *Direct Recharge to Nonpotable Ground Water***

Reclaimed water quality criteria for direct recharge of reclaimed water into nonpotable ground water aquifers shall be determined by the department on a case-by-case basis, taking into consideration the existing ground water quality, hydrogeology, subsequent use of any reclaimed water that is withdrawn from the underground, and other factors.

As a minimum, the following criteria shall be met:

- (1) Class A reclaimed water requirements for total coliform organisms;
- (2) BOD  $\leq$  5 mg/L;
- (3) TSS  $\leq$  5 mg/L; and
- (4) any other constituent limits deemed appropriate by the Departments of Ecology or Health.

**Section 3.      *Point of Compliance***

- (a) The point of compliance is the location where reclaimed water quality criteria required pursuant to these standards shall be measured and shall not be exceeded pursuant to these standards.
- (b) The point of compliance with reclaimed water quality and monitoring criteria required pursuant to these standards shall be the point of direct recharge of reclaimed water into the underground. Generally, the reclaimed water quality compliance point will be at a location immediately prior to injection into the underground.



## **Article 4. Sampling and Analysis**

### **Section 1.     *Oxidized Wastewater***

- (a)     Samples for BOD shall be 24-hour composite samples. Samples for BOD shall be collected at least weekly. Compliance with the BOD requirement shall be determined monthly, based on the arithmetic mean of all samples collected during the month.
- (b)     Samples for TSS shall be 24-hour composite samples. Samples for TSS shall be collected at least daily. Compliance with the TSS requirement shall be determined monthly, based on the arithmetic mean of all samples collected during the month.
- (c)     Grab samples for dissolved oxygen shall be collected at least daily and at a time when wastewater characteristics are most demanding on the treatment facilities.

### **Section 2.     *Filtered Wastewater***

Turbidity analysis shall be performed by a continuous recording turbidimeter. Turbidity measurements shall be read at least every four hours. Compliance with the average operating turbidity requirement shall be determined monthly, based on the arithmetic mean of all measurements read during the month.

### **Section 3.     *Reclaimed Water***

- (a)     Samples for BOD shall be 24-hour composite samples. Samples for BOD shall be collected at least daily. Compliance with the BOD requirement shall be determined daily, based on the arithmetic mean of all daily samples collected during the last 7 days of operation.
- (b)     Samples for TSS shall be 24-hour composite samples. Samples for TSS shall be collected at least daily. Compliance with the TSS requirement shall be determined daily, based on the arithmetic mean of all daily samples collected during the last 7 days of operation.
- (c)     Grab samples for total coliform organisms shall be collected at least daily and at a time when wastewater characteristics are most demanding on the treatment facilities and disinfection procedures. Compliance with the coliform requirements shall be determined daily, based on the median value determined from the bacteriological results of the last 7 days for which analyses have been completed.
- (d)     Turbidity analysis shall be performed by a continuous recording turbidimeter. Turbidity measurements shall be read at least every four hours. Compliance with the average operating turbidity requirement shall be determined monthly, based on the arithmetic mean of all measurements read during the month.
- (e)     Samples for TOC shall be 24-hour composite samples. Samples for TOC shall be collected at least daily. Compliance with the TOC requirement shall be determined daily, based on the arithmetic mean of all daily samples collected during the last 30 days of operation.
- (f)     Samples for primary contaminants (except total coliform organisms), secondary contaminants, radionuclides, and carcinogens, shall be grab or 24-hour composite

samples. Samples for primary contaminants (except total coliform organisms), secondary contaminants, radionuclides, and carcinogens shall be collected at least quarterly. Compliance with each constituent requirement (except total coliform organisms) shall be determined annually, based on the arithmetic mean of all samples collected during the previous 12 months.

- (g) Samples for total nitrogen shall be grab or 24-hour composite samples. Samples for total nitrogen shall be collected at least weekly. Compliance with the total nitrogen requirement shall be determined annually, based on the arithmetic mean of all samples collected during the previous 12 months.
- (h) Samples for constituents not included in this section, and their compliance requirements, may be specified by the Departments of Ecology and Health within water quality permits to satisfy existing regulatory requirements or to meet health regulations.

***Section 4. Ground Water from Monitoring Wells***

- (a) Samples from monitoring wells for constituents required pursuant to Article 5, Section 9(b)(1)(i) shall be collected at least quarterly.
- (b) Samples from monitoring wells for constituents required pursuant to Article 5, Section 9(b)(2)(i), and their sampling frequency, shall be determined on a case-by-case basis by the department.

***Section 5. Laboratory Methods and Analyses***

Samples collected pursuant to this article shall be analyzed by approved laboratory methods, and analyses shall be conducted in laboratories approved by the department.

**Article 5. Operational Requirements**

***Section 1. Personnel***

- (a) Each reclamation plant shall be provided with a sufficient number of qualified personnel to operate the facility effectively so as to achieve the required level of treatment at all times.
- (b) Qualified personnel shall be those meeting wastewater treatment plant certification and other requirements established pursuant to chapter 173-230 WAC, Statutory Authority RCW 78.95.

***Section 2. Maintenance***

A preventive maintenance program shall be provided at each reclamation plant to ensure that all equipment is kept in a reliable operating condition.

***Section 3. Operating Records and Reports***

- (a) Operating records shall be maintained at the reclamation plant or a central depository within the operating agency. These shall include: all analyses specified in these regulations; records of operational problems, unit process and equipment breakdowns, and diversions to emergency storage or disposal; and all corrective or preventive action taken.



- (b) Process or equipment failures triggering an alarm shall be recorded and maintained as a separate record file. The recorded information shall include the time and cause of failure and corrective action taken.
- (c) A monthly summary of operating records as specified under (a) of this section shall be filed monthly with the Washington Departments of Ecology and Health.
- (d) Any direct recharge of untreated or partially treated wastewater to the underground, and the cessation of same, shall be reported immediately by telephone to the Washington Departments of Ecology and Health and the local health department.

#### ***Section 4. Bypass***

There shall be no bypassing of untreated or partially treated wastewater from the reclamation plant or any intermediate unit processes to the point of recharge.

#### ***Section 5. Disinfection***

- (a) Where chlorine is used as the disinfectant in the treatment process a minimum chlorine residual of 1 mg/L after a minimum contact time of 30 minutes, based on peak hourly flow, is required. A CT value greater than provided under these standards to assure pathogen reduction may be required by the Washington Department of Health.
- (b) If pipelines or other facilities are used to meet the required chlorine contact time, such facilities are considered to be part of the treatment process and shall be subject to applicable requirements of these regulations and any other reclamation requirements specified by the Washington Departments of Health and Ecology.
- (c) A chlorine residual of at least 0.5 mg/L shall be maintained in the reclaimed water during conveyance from the reclamation plant to the point of recharge unless waived by the Departments of Health and Ecology.
- (d) Maintenance of a chlorine residual is not required in reclaimed water storage ponds, and, at the discretion of the Washington Departments of Health and Ecology, may not be required in reclaimed water conveyed from storage ponds to the point of recharge.
- (e) Review and approval of the design and installation of ultraviolet radiation, ozonation, mixed oxidant or other non-chlorine based disinfection systems shall be performed on a case-by-case basis. Design and operation requirements shall conform to recognized standards and engineering practices as defined by USEPA, Water Environment Federation, American Society of Civil Engineers, American Water Works Association and other recognized engineering references.

#### ***Section 6. Responsibilities***

- (a) The permittee shall maintain control over, and be responsible for, all facilities and activities inherent to the production of reclaimed water to ensure that the reclamation plant operates as approved by the Washington Departments of Ecology and Health. The permittee shall control industrial and toxic discharges

that may affect reclaimed water quality through either a delegated pretreatment program with the department or assuring all applicable discharges have permits issued under RCW 90.48 and chapter 173-220 WAC.

- (b) Where the reclaimed water transmission and distribution system or direct recharge facilities are under direct control of the permittee, the permittee shall maintain control, and be responsible for, all facilities and activities inherent to the direct recharge of the reclaimed water to ensure that the entire reuse system operates as approved by the Washington Departments of Ecology and Health.
- (c) Where the reclaimed water transmission and distribution system or direct recharge facilities are not under direct control of the permittee, the person(s) who conveys reclaimed water, owns, or otherwise maintains control over the direct recharge facilities is responsible for reuse facilities and activities inherent to the conveyance and direct recharge of the reclaimed water to ensure that the system operates as approved by the Washington Departments of Ecology and Health.
- (d) The permittee or person(s) who maintains control over the direct recharge facilities where the recharged water is withdrawn as a source of drinking water supply shall prevent the withdrawal of ground water within the area required to achieve the minimum retention time in the underground specified in Article 5, Section 7(a), and minimum horizontal separation distance between the point of direct recharge and withdrawal specified in Article 5, Section 8(a).
- (e) Where the reclaimed water transmission and distribution system or direct recharge facilities are not under direct control of the permittee, a binding agreement among the parties involved is required to ensure that construction, operation, maintenance, and monitoring meet all requirements of the Washington Departments of Ecology and Health.

***Section 7. Retention Time in the Underground***

- (a) Reclaimed water shall be retained underground for a minimum of 12 months prior to being withdrawn as a source of drinking water supply.
- (b) Reclaimed water withdrawn for nonpotable purposes can be withdrawn at any time after direct recharge.

***Section 8. Separation Distance in the Underground***

- (a) The minimum horizontal separation distance between the point of direct recharge and withdrawal as a source of drinking water supply shall be 2,000 feet.
- (b) Reclaimed water withdrawn for nonpotable purposes can be withdrawn at any distance from the point of direct recharge.

***Section 9. Ground Water Monitoring***

- (a) A ground water monitoring program will be required by the Washington Departments of Ecology and Health. The ground water monitoring program shall be established by the permittee and approved by the Washington Departments of Ecology and Health. The monitoring program shall be based on reclaimed water



quality and quantity, site specific soil and hydrogeologic characteristics, and other considerations.

- (b) Monitoring wells shall be provided to detect the influence of the direct recharge operation.
  - (1) For direct recharge into potable ground water aquifers, monitoring wells, as a minimum, shall be located at points 500 feet and 1,000 feet (plus or minus 10%) along the ground water flow path from the point of recharge to the nearest point of withdrawal of ground water used as a source of drinking water supply. The number and location of proposed monitoring wells shall be described in the engineering report submitted pursuant to Article 9.
    - (i) Ground water from monitoring wells shall be sampled for TOC and primary contaminants, secondary contaminants, radionuclides, and carcinogens listed in Table 1 in chapter 173-200 WAC.
    - (ii) Sampling for constituents other than those required pursuant to Article 5, Section 9(b)(1)(i) may be specified by the Departments of Ecology and Health.
  - (2) For direct recharge into nonpotable ground water aquifers, monitoring wells shall be established on a case-by-case basis. At the discretion of the Departments of Ecology and Health, withdrawal wells that extract ground water for nonpotable applications may be designated as monitoring wells.
    - (i) Constituents to be sampled from ground water monitoring wells shall be determined on a case-by-case basis by the department.

## **Article 6. General Requirements of Design**

### **Section 1. Flexibility of Design**

The design of process piping, equipment arrangement, and unit structures in the reclamation plant must allow for efficiency and convenience in operation and maintenance and provide flexibility of operation to permit the highest possible degree of treatment to be obtained under varying circumstances.

### **Section 2. Alarms**

- (a) Alarms required for various unit processes as specified in other sections of these regulations shall be installed to provide warning of:
  - (1) Loss of power from the normal power supply,
  - (2) Failure of a biological treatment process,
  - (3) Failure of a disinfection process,
  - (4) Failure of a coagulation process,



- (5) Failure of a filtration process,
  - (6) Failure of a reverse osmosis process, and
  - (7) Any other specific process failure for which warning is required by the Washington Departments of Health and Ecology.
- (b) All required alarms shall be independent of the normal power supply of the reclamation plant.
  - (c) The person to be warned shall be the plant operator, superintendent, or other responsible person designated by the management of the reclamation plant and capable of taking prompt corrective action.
  - (d) Individual alarms may be connected to a master alarm to sound at a location where it can be conveniently observed by the attendant. Where the reclamation plant is not attended full time, the alarm(s) shall be connected to sound at a police station, fire station or other full-time service unit with which arrangements have been made to alert the person in charge at times that the reclamation plant is unattended.

***Section 3. Power Supply***

The power supply shall be provided with one of the following reliability features:

- (1) Alarm and standby power source.
- (2) Alarm and automatically actuated short-term storage or disposal provisions as specified in Article 7, Section 1(a).
- (3) Automatically actuated long-term storage or disposal provisions as specified in Article 7, Section 1(b).

***Section 4. Storage, Where No Approved Alternative Disposal System Exists***

- (a) Where no alternative disposal system is permitted, system storage or other acceptable means shall be provided to assure the retention of reclaimed water at times when recharge is precluded.
- (b) At a minimum, system storage capacity shall be the volume equal to three times that portion of the average daily flow of reuse capacity for which no alternative reuse or disposal system is permitted.

**Article 7. Alternative Reliability Requirements**

***Section 1. Emergency Storage or Disposal***

- (a) Where short-term storage or disposal provisions are used as a reliability feature, these shall consist of facilities reserved for the purpose of storing or disposing of untreated or partially treated wastewater for at least a 24-hour period. The facilities shall include all the necessary diversion works, provisions for odor control, conduits, and pumping and pump back equipment. All of the equipment



other than the pump back equipment shall be either independent of the normal power supply or provided with a standby power source.

- (b) Where long-term storage or disposal provisions are used as a reliability feature, these shall consist of ponds, reservoirs, percolation areas, downstream sewers leading to other treatment or disposal facilities or any other facilities reserved for the purpose of emergency storage or disposal of untreated or partially treated wastewater. These facilities shall be of sufficient capacity to provide disposal or storage of wastewater for at least 20 days, and shall include all the necessary diversion works, provisions for odor and nuisance control, conduits, and pumping and pump back equipment. All of the equipment other than the pump back equipment shall be either independent of the normal power supply or provided with a standby power source.
- (c) Diversion to a different type of reuse is an acceptable alternative to emergency disposal of partially treated wastewater provided that the quality of the partially treated wastewater is suitable for that type of reuse.
- (d) Subject to prior approval by the Washington Departments of Ecology and Health, diversion to a discharge point where the wastewater meets all discharge requirements is an acceptable alternative to emergency disposal of partially treated wastewater.
- (e) Automatically actuated short-term storage or disposal provisions and automatically actuated long-term storage or disposal provisions shall include, in addition to provisions of (a), (b), (c), or (d) of this section, all the necessary sensors, instruments, valves, and other devices to enable fully automatic diversion of untreated or partially treated wastewater to approved emergency storage or disposal in the event of failure of the treatment process, and a manual reset to prevent automatic restart until the failure is corrected.

## ***Section 2. Biological Treatment***

All biological treatment unit processes shall be provided with one of the following reliability features:

- (1) Alarm and multiple biological treatment units capable of producing oxidized wastewater with one unit not in operation;
- (2) Alarm, short-term storage or disposal provisions, and standby replacement equipment;
- (3) Alarm and long-term storage or disposal provisions; or
- (4) Automatically actuated long-term storage or disposal provisions.

## ***Section 3. Secondary Sedimentation***

All secondary sedimentation unit processes shall be provided with one of the following reliability features:



- (1) Multiple sedimentation units capable of treating the entire flow with one unit not in operation;
- (2) Standby sedimentation unit process; or
- (3) long-term storage or disposal provisions.

**Section 4. Coagulation**

- (a) All coagulation unit processes shall be provided with the following features for uninterrupted chemical feed:
  - (1) Standby feeders;
  - (2) Adequate chemical storage and conveyance facilities;
  - (3) Adequate reserve chemical supply; and
  - (4) Automatic dosage control.
- (b) All coagulation unit processes shall be provided with one of the following reliability features:
  - (1) Alarm and multiple coagulation units capable of treating the entire flow with one unit not in operation;
  - (2) Alarm, short-term storage or disposal provisions, and standby replacement equipment;
  - (3) Alarm and long-term storage or disposal provisions;
  - (4) Automatically actuated long-term storage or disposal provisions; or
  - (5) Alarm and standby coagulation unit process.

**Section 5. Filtration**

All filtration unit processes shall be provided with one of the following reliability features:

- (1) Alarm and multiple filter units capable of treating the entire flow with one unit not in operation;
- (2) Alarm, short-term storage or disposal provisions and standby replacement equipment;
- (3) Alarm and long-term storage or disposal provisions;
- (4) Automatically actuated long-term storage or disposal provisions; or
- (5) Alarm and standby filtration unit process.

**Section 6.      *Reverse Osmosis***

All reverse osmosis unit processes shall be provided with one of the following reliability features:

- (1) Alarm and multiple reverse osmosis units capable of treating the entire flow with one unit not in operation;
- (2) Alarm, short-term storage or disposal provisions and standby replacement equipment;
- (3) Alarm and long-term storage or disposal provisions;
- (4) Automatically actuated long-term storage or disposal provisions; or
- (5) Alarm and standby reverse osmosis unit process.

**Section 7.      *Disinfection***

(a) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with the following features for uninterrupted chlorine feed:

- (1) Standby chlorinator;
- (2) Standby chlorine supply;
- (3) Manifold systems to connect chlorine cylinders;
- (4) Chlorine scales;
- (5) Automatic switchover to full chlorine cylinders; and
- (6) Continuous measuring and recording of chlorine residual.

(b) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with one of the following reliability features:

- (1) Alarm and standby chlorinator;
- (2) Alarm, short-term storage or disposal provisions, and standby replacement equipment;
- (3) Alarm and long-term storage or disposal provisions;
- (4) Automatically actuated long-term storage or disposal provisions; or
- (5) Alarm and multiple point chlorination. Each point of chlorination shall have an independent power source, separate chlorinator, and separate chlorine supply.

(c) All other disinfection unit processes shall be provided with one of the following reliability features:



**Table 1.**  
**Treatment/Quality Requirements for Direct Recharge with Reclaimed Water**

Use	Treatment Requirements	Quality Requirements
Direct recharge into nonpotable ground water aquifers	Class A reclaimed water treatment	Class A reclaimed water quality requirements  BOD $\leq$ 5 mg/L  TSS $\leq$ 5 mg/L
Direct recharge into potable ground water aquifers	Oxidation  Filtration  Coagulation  Reverse osmosis  Disinfection	Class A reclaimed water quality requirements (except for total coliform organisms)  Water quality criteria for primary contaminants (except nitrate), secondary contaminants, radionuclides, and carcinogens listed in Table 1 in chapter 173-200 WAC  Other drinking water MCLs  Turbidity $\leq$ 0.1 NTU  Total nitrogen $\leq$ 10 mg/L (as N)  TOC $\leq$ 1.0 mg/L

**Table 2.**  
**Monitoring Requirements for Direct Recharge with Reclaimed Water**

Parameter	Sample Type & Frequency	Compliance Requirements
<b>Oxidized Wastewater:</b>		
BOD	24-hour composite, collected at least weekly	≤ 30 mg/L average determined monthly, based on arithmetic mean of all samples collected during the month
TSS	24-hour composite, collected at least daily	≤ 30 mg/L average determined monthly, based on arithmetic mean of all samples collected during the month
Dissolved oxygen	Grab, collected at least daily	Shall contain dissolved oxygen
<b>Filtered Wastewater:</b>		
Turbidity	Continuous recording turbidimeter	≤ 2 NTU average determined monthly; 5 NTU maximum
<b>Reclaimed Water:</b>		
BOD	24-hour composite, collected at least daily	≤ 5 mg/L average determined daily, based on arithmetic mean of all daily samples collected during last 7 days of operation
TSS	24-hour composite, collected at least daily	≤ 5 mg/L average determined daily, based on arithmetic mean of all daily samples collected during last 7 days of operation
Total coliforms	Grab, collected at least daily	1/100 mL median value determined daily based on bacteriological results of last 7 days for which analyses have been completed; 5/100 mL maximum
TOC	24-hour composite, collected at least daily	≤ 1.0 mg/L average determined daily, based on arithmetic mean of all samples collected during last 30 days of operation
Primary contaminants (except total coliforms and nitrate), secondary contaminants, radionuclides, and carcinogens listed in chapter 173-200 WAC	Grab or 24-hour composite, collected at least quarterly	Compliance with limits listed in Table 1 in chapter 173-200 WAC determined annually, based on arithmetic mean of all samples collected during previous 12 months
Total Nitrogen	Grab or 24-hour composite, collected at least weekly	≤ 10 mg/L (as N) average determined annually, based on arithmetic mean of all samples collected during previous 12 months



**Table 2.**  
**Monitoring Requirements for Direct Recharge with Reclaimed Water (Cont.)**

Parameter	Sample Type & Frequency	Compliance Requirements
<b>Potable Ground Water from Monitoring Wells:</b>		
TOC	Grab, collected at least quarterly	No limit specified in these standards
Primary contaminants, secondary contaminants, radionuclides, and carcinogens listed in chapter 173-200 WAC	Grab, collected at least quarterly	No limits specified in these standards
<b>Nonpotable Ground Water from Monitoring Wells:</b>		
Case-by-case determination	Case-by-case determination	Case-by-case determination